AMENDMENTS TO THE CLAIMS

Please amend claims 1, 7, 10, 13, 19, 20, 24, and 29-32 as follows:

1. (Currently Amended) A system for providing private network services using private addresses in a location remote from private network users, comprising:

a host computer executing a plurality of private virtual servers, each private virtual server associated with a private network address space and providing private network services to the private network's users, the private network's users located remotely from the private virtual server, wherein a first private network address space associated with a first virtual server and a second private network address space associated with a second virtual server overlap; and

a multiplexing/demultiplexing mechanism executed by the host computer, and communicatively coupled to a network to receive, over a tunnel, a signal from a private network user and to route the received signal to the private virtual server associated with the private network user's network.

2. (Previously Presented) The system of claim 1 wherein the multiplexing/demultiplexing mechanism switches signals between private virtual servers and tunnels associated with private networks.

3. (Original) The system of claim 1, wherein the multiplexing/demultiplexing mechanism demultiplexes an incoming set of signals into segregated signals, and routes each segregated signal to the private virtual server associated with the private network that transmitted the segregated signal.

4. (Previously Presented) The system of claim 1, wherein the multiplexing/demultiplexing mechanism receives an outgoing set of signals, and routes the signals to outgoing tunnels associated with the private virtual servers that transmitted the signals.

5. (Original) The system of claim 1, wherein the multiplexing/demultiplexing

mechanism is located on the host computer.

6. (Original) The system of claim 1, wherein the multiplexing/demultiplexing mechanism contains a lookup table, the lookup table storing associations between tunnel identifiers identifying tunnels for private networks and private virtual servers that service the private networks.

7. (Currently Amended) A system for providing private network services using private addresses in a location remote from private network users, comprising:

a plurality of host server computers, a host server computer executing a plurality of private virtual servers, wherein each private virtual server is associated with a private network-and wherein a first private network associated with a first private virtual server and a second private network associated with a second private virtual server have overlapping address spaces;

a switching mechanism communicatively connected to private network users over a network and to the plurality of host server computers to receive, over a tunnel, signals from the private network users and route each signal to the host server computer executing the private virtual server associated with the private network user's network; and

a multiplexing/demultiplexing mechanism communicatively coupled to the switching mechanism for receiving signals from the switching mechanism and routing signals to the correct private virtual server executing on the host server.

8. (Original) The system of claim 7, wherein the signals are addressed using a private address space.

9. (Previously Presented) The system of claim 7, further including:

at least one tunnel for transmitting a signal between a private network and the switching mechanism.

10. (Currently Amended) A system for managing virtual servers using private addresses, and wherein the virtual servers are located in a location remote from private network

users, comprising:

a plurality of host computers, a host computer executing a plurality of virtual servers residing on the host computer, a virtual server associated with a private network, and wherein a first private network associated with a first virtual server and a second private network associated with a second virtual server have overlapping address spaces;

a tunnel switching mechanism communicatively coupled to the host computers, and communicatively coupled to a network to receive, over a tunnel, signals from a private network user, and to route a received signal to the host computer executing the virtual server associated with the private network user's network; and

a multiplexing/demultiplexing mechanism executed by each host computer, and communicatively coupled to a network to receive signals from a private network user, and to route a received signal to the virtual server executing on the host computer that is associated with the private network user's network.

11. (Original) The system of claim 10, wherein the private address spaces of a first and a second virtual server overlap.

12. (Previously Presented) The system of claim 10, further comprising:

a customer lookup table, the customer lookup table storing associations between physical interfaces and tunnel identifiers identifying tunnels for private networks and a plurality of customer forwarding tables; and

a plurality of customer forwarding tables, each customer forwarding table associating network addresses with physical interfaces and tunnel identifiers.

13. (Currently Amended) In a system comprising a host computer containing a plurality of virtual servers that each support a private network address space wherein the private network address spaces of two or more of the virtual servers overlap, a method for providing private network services in a location remote from private network users of the virtual servers, the method comprising:

receiving, over a tunnel, a transmission addressed using a private network address of

a recipient; and

routing the transmission to a virtual server associated with a network of at least one of the sender or the recipient of the transmission.

14. (Original) The method of claim 13, further comprising receiving the transmission via a tunnel from a private network.

15. (Original) The method of claim 13, further comprising routing the transmission based upon a layer two tunnel identifier.

16. (Original) The method of claim 13, wherein routing the transmission to a virtual server comprises:

terminating an incoming tunnel containing a transmission; and

multiplexing the transmission to a virtual server.

17. (Previously Presented) The method of claim 16, further comprising:

reading a tunnel identifier contained in the transmission; and

selecting a virtual server based upon the tunnel identifier.

18. (Previously Presented) The method of claim 13, wherein routing the transmission to a virtual server comprises:

terminating an incoming tunnel containing a transmission;

switching the transmission to a tunnel connected to a physical host computer containing a private network's virtual server;

terminating the tunnel at the physical host computer; and

multiplexing the transmission to the virtual server.

19. (Currently Amended) In a system comprising a host computer containing a plurality of virtual servers which support a private network address space wherein the private network address spaces of two or more of the virtual servers overlap, a method for providing private network services using private addresses in a location remote from private network users, the method comprising:

storing a customer lookup table, the customer lookup table storing associations between physical interfaces and tunnel identifiers identifying tunnels for private networks and a plurality of customer forwarding tables;

storing a plurality of customer forwarding tables, the customer forwarding tables associating network addresses with physical interfaces and tunnel identifiers;

receiving, over a tunnel, a transmission on a physical interface, the transmission containing a tunnel identifier;

determining the correct customer forwarding table from the customer lookup table using the physical interface and the tunnel identifier;

determining via the customer forwarding table a physical interface and tunnel identifier associated with a network address of the transmission; and

sending the transmission to the network address on the determined physical interface using the determined tunnel identifier.

20. (Currently Amended) In a system comprising a host computer containing a plurality of virtual servers which support a private network address space wherein the private network address spaces of two or more of the virtual servers overlap, a method for a private network to use private network services, wherein the private network services are located remotely from the private network, the method comprising:

sending, over a tunnel, a privately addressed transmission ~~on a tunnel~~ to a virtual server; and

receiving, over a tunnel, a privately addressed transmission back from the virtual server.

21. (Original) The method of claim 20, wherein the privately addressed transmission does not include a registered IP address.

22. (Original) The method of claim 20, wherein the tunnel encapsulates the privately-addressed transmissions in a layer two protocol.

23. (Original) The method of claim 20, further comprising:

segregating a first transmission including an Internet address from a second transmission including a virtual server address; and

sending the second transmission on a tunnel.

24. (Currently Amended) A method for creating a software architecture suitable for implementing a virtual server system supporting private network address spaces, wherein the private network address spaces overlap, the method comprising:

implementing a tunneling protocol to ~~tunnel~~ transmit, over a tunnel, privately-addressed transmissions between a plurality of virtual servers and a plurality of users; and

implementing a separate routing context on behalf of each user to route privately-addressed transmissions between the users and the virtual servers.

25. (Original) The method of claim 24, wherein the tunneling protocol is Asynchronous Transfer Mode virtual circuits.

26. (Original) The method of claim 24, wherein the tunneling protocol is frame relay virtual circuits.

27. (Previously Presented) The method of claim 24, wherein the tunneling protocol is Point-to-Point protocol across Layer two Tunneling Protocol.

28. (Previously Presented) The method of claim 24, wherein the tunneling protocol is Internet Protocol security protocol.

29. (Currently Amended) A computer-readable medium containing a computer program product for switching signals between private virtual servers supporting private network address spaces, wherein the private network address spaces overlap, and tunnels associated with private network users, the computer program product comprising:

program ~~code~~ instructions for demultiplexing an incoming set of signals into segregated signals; and

program ~~code~~ instructions for routing each segregated signal to the private virtual server associated with the private network user that transmitted the segregated signal.

30. (Currently Amended) The computer program product of claim 29, further ~~including~~ comprising:

program ~~code~~ instructions for receiving an outgoing signal; and

program ~~code~~ instructions for routing the outgoing signal to an outgoing tunnel associated with the private virtual server that transmitted the signal.

31. (Currently Amended) A computer-readable medium containing a computer program product for managing virtual servers that support private network address spaces, wherein the private network address spaces overlap, and wherein the virtual servers are located in a location remote from private network users, the computer program product comprising:

program ~~code~~ instructions for using a plurality of virtual servers residing on a plurality of host computers;

program ~~code~~ instructions to receive signals from any of the private network users, and to route received signals to each host computer executing the virtual server associated with the private network user; and

program ~~code~~ instructions to route received signals to the virtual server executing on the host computer that is associated with the private network user.

32. (Currently Amended) The computer program product of claim 31, further

~~including~~ comprising:

program ~~code~~ instructions for storing associations between physical interfaces and tunnel identifiers identifying tunnels for private networks, and a plurality of customer forwarding tables; and

program ~~code~~ instructions for creating a plurality of customer forwarding tables, each customer forwarding table associating network addresses with physical interfaces and tunnel identifiers.